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# Longevity of Selected Species from a 50-year File

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## Introduction - locations, descriptions of stations.

In the course of 50 years of back yard banding I have stuffed 23 shoeboxes of index cards with the records of some 25,000 birds of 143 species.

It has been my good fortune to live for a period of at least 10 years in each of three rural homes, where a landscaped yard abuts on weedy pastures, brushy hedgerows, and wooded ravines. There have been ponds and streams nearby, unobtrusive neighbors, and minimal disturbances (kids, feral pets, occasional raptors).

These back yards were located in the Southern Plains of central Oklahoma (Stillwater); on a little trout stream in central Wisconsin (Stevens Point); and in the Ozark hills of Oklahoma (Jay).

An additional station of a somewhat different nature was in Door County, Wisconsin, where for almost 20 years we taught a bird class in mid May at The Clearing, an idyllic little school for adult enrichment in a northwoods setting. Though we were there for only one week a year and had limited time for banding, we found the accumulated records for several species worthy of inclusion in this study of longevity, notably Black-capped Chickadees and Rose-breasted Grosbeaks.

Table 1 gives for each station the geographic location, number of years, number and types of traps used, total species and individuals captured.

**Table 1. Geographic Locations and Descriptions of Major Stations**

STATE	NEAREST TOWN	NO. YEARS	TOTAL SPECIES	TOTAL INDIVIDUALS
A Central Oklahoma	2 N Stillwater	18	74	5,366
B Central Wisconsin	5 SE Stevens Point	10	63	3,778
C NE Wisconsin, Door Co., The Clearing School	14 1-week sessions in mid May		16	448
D NE Oklahoma (Ozarks)	5 S Jay	10	110	14,851
Totals 4 Locations (no duplication)			143	24,443

It was interesting to note, and perhaps typical, that at each of these stations approximately 20 percent of the species accounted for some 90 percent of the individuals captured. In northeast Oklahoma less than 14 percent of the 110 species account for 90 percent of the almost 15,000 individuals, due to periodic incursions of finches, and to a large hummingbird population.

## Types of Traps and Seasons Used

- A **Central Oklahoma:** potter, 10 cells + 6 ft. dia. cloverleaf + walk-in 4×4×6 ft.; no nets; automatic; continuous most of school year, occasionally summer. (15 species - 20% - account for 4,938 individuals - 92%).
- B **Central Wisconsin:** potter, 10 cells + cloverleaf; 2 nets occasionally; automatic; average 3 hrs./day year round with long breaks. (13 species - 20.6% - account for 3,389 individuals - 90%).
- C **NE Wisconsin:** potter, 14 cells, automatic; average 3 hrs./day, 6 day sessions; 2 nets occasional use; (4 species - 25% - account for practically all, 402 individuals - 89.7%).
- D **NE Oklahoma:** potter, 14 cells; automatic; daily year round with long breaks; average 3 hrs./day; cloverleaf Nov. - Apr.; 5 nets Apr. - Nov.; 12+ hrs/week; 2 hummingbird traps, cylindrical, drop-door, manually operated, average 3 hrs/day 3+ days/week mid-Apr. - early Oct., (also capture some hummers in nets.) (15 species - 13.6% - account for 13,225 individuals - 89.1%).

## Procedures

For each of these stations I have tallied total numbers captured and year by year returns, determining the survival ratios for species, and for age and sex differences when discernible and significant. Species that occurred in numbers in more than one locality were tabulated separately, to consider possible variables due to geography or ecological factors.

The ten species of which I have banded the largest numbers are listed below. Some occurred at all stations, some at only one. Topping the list (to be expected) are the northern finches, whose periodic incursions are staggering:

TOTALS	SPECIES	STATUS
4053	American Goldfinch	WR, some SR, some PR
2564	Purple Finch	WR
1834	Pine Siskin	WR
1819	Dark-eyed Junco	WR (I discontinued banding these in 1980, except a sampling, including several adult male Oregons R-1, which occurred at all three major stations.)
1723	Harris' Sparrow	WR (Central Okla. only)
1641	Ruby-throated Hummingbird	SR (NE Oklahoma only)
1065	Northern Cardinal	PR (both Okla. stations)
951	Blue Jay	WR, some SR, some PR
933	Chickadees (habits similar)	PR (Black-capped - 536 Wisconsin (Carolina - 370 Oklahoma)
870	American Tree Sparrow	WR (principally Central Oklahoma, but including 150± during Cornell grad studies)

Table 2 is a digest of 20 selected species, including those most abundant and those with the oldest return records. They represent a cross-section of small land bird families, listed in AOU 1983 sequence. For each species I have tabulated its *geographic location, seasonal status, total banded, total returns, percent of returns, and survival ratios* (total surviving to final age level whether present at each level or not.) *Oldest Ages* are listed, with age - sex if known.

Though most of these species are migratory, residence status of individuals during part or all of a year is essential for longevity data. My records include WR, SR, and some species that may occur at varying times of year (possibly PR?).

The heading *Total Returned* infers an encounter approximately a year from time of banding, with R-1, R-2, etc. for succeeding years. Many birds are "skippers", missing one or more years; these are tallied in the *Survival Ratio* to the last encounter.

A bird that was banded as a first-year (im.) bird and returned four years later is tallied as "age 4". If banded as an adult, the age is "at least 4 years" or "5 years". Foreign recoveries are included for birds of advanced age.

## Analysis of Data (Table 2)

Typically the small land birds that inhabit our back yards show a conspicuous drop in numbers after their first year. On a year-round basis including many migrants, a return of 4-5% is normal but not really indicative of longevity. A return ratio of 8-10% may be achieved by screening out migrants. A return ratio of 20% is noteworthy. Beyond that point one must seek special factors that influence the data.

At all of my stations, the largest proportions (though not largest numbers) of return birds have included the permanent residents, particularly those that become addicted to the fare in well-stocked feeders. Thus (permanent residents with high return ratio):

SPECIES	% RETURNED	INFLUENCING FACTORS
Red-bellied Woodpecker	54.2%	Sedentary species; reside within ½ mi. of station; color banded for ready identification; includes 2 age 9.
Downy Woodpecker	32.4%	Sedentary species; easily baited.
Bl.-capped Chickadee	16.4%	ibid. (Central Wis.); many sedentary
	36.3%	ibid. (NE Wis.); nesting nearby
Carolina Chickadee	21.4%	(Okla.); many sedentary
Tufted Titmouse	26.0%	ibid.
Wh.-breasted Nuthatch	23.5%	ibid. (of 99 banded at Jay, 38.3% R)
N. Cardinal	10.4%	(Central Okla., ranged up and down ravine, fewer in yard)
	20.0%	(NE Okla., station in midst of ideal habitat)
Field Sparrow	20.1%	(Central Okla., many dependent upon station during early spring snows)
	11.7%	(NE Okla., station in ideal habitat)

Returns of summer residents are less often recorded, because birds are less dependent upon feeders. However there are exceptions:

Ruby-th. Hummingbird	14.7%	(NE Okla.)
Rose-br. Grosbeak	21.9% and 21.3%	at the two Wisconsin stations.

Winter residents including large numbers of migrants yield relatively "average" return ratios:

Blue Jay	8.7%
Harris' Sparrow	8.9%
Purple Finch	7.9%
American Goldfinch	11.6%

**Table 2. Survival Ratios of Selected Species (primarily most abundant species, also species yielding old returns or FR's [5+ years])**

SPECIES	LOCATION	STATUS	TOTAL Banded	TOTAL RETURNED	SURVIVAL FROM YEAR OF BANDING								OLDEST AGES	FR of B's
					R <sup>1</sup>	R <sup>2</sup>	R <sup>3</sup>	R <sup>4</sup>	R <sup>5</sup>	R <sup>6</sup>	R <sup>7</sup>	R <sup>8</sup>		
Ruby throated Hummingbird (Age-Sex ratios)	D	SR	1641	242 (14.7%)	242	97	45	14 M-2 M-1 F-2 F-2	7 2 2	3 1 1	1		(age 5) (age 4) (age 8) (age 6)	
Red-bellied Woodpecker (color-banded)	D	PR	24	13 (54.2%)	13	10	7	5	4		3	2	(age 9)	
Downy Woodpecker	B	PR	37	12 (32.4%)	12	4	3	2	(age 5)		1		(age 8)	
Purple Martin (never total pop.)	A	SR	116AHY 333N 449	13 5 18	13 5	2 2	1	(M age 5) (1 F age 5) (1 U age 4)					(age 5)	1 age 5
Blue Jay	A B C D	Some WR SR PR	38 399 117 397 951	2 55 7 19 83 8.7%	2 55 7 19		1 10 3 9	4 (age 5) 6			1 2		(age 8) (age 9) (age 6)	1 Mich.
Black-capped Chickadee	B C	PR	511 52	84 19 (16.4%) (36.3%) (18.3%)	84 19	35 10	20 5	7 2	3 1	2			(2 age 7) (4 age 6)	1 Mich.
Carolina Chickadee	A D	PR	90 280 370	5 60 (21.4%)	5 60	1 27	17	7					(3 age 5) (4 age 4)	
Tufted Titmouse	D	PR	219	57 (26%)	57	28	14	7	3				(3 age 5) (4 age 4)	
White-breasted Nuthatch	B D	PR	51 99 150	12 38 (23.5%) (38.3%)	12 38	4 25	3 13	2		3 2	1		(2 age 5) (4.7%) (1 age 8)	
Bewicks' Wren	A	SR+	102	5		5	3	1					(1 age 4)	
Eastern Bluebird	D	PR	340	9	9	3					1M		(1 age 7 1/2)	
Summer Tanager	D	SR	64	2	2				1				(1 age 6)	
N. Cardinal (M-F equal no.)	A D	PR PR	511 507 1018	53 104 (10.4%) (20+ %)	53 M 48 F 56	22 23 25	12 10 15	8 7 8	6 6 6	5 2 2	3 1 0		(1 age 12) (2 age 7) (2 age 6) (2 age 6)	1
Rose-breasted Grosbeak (M-F equal no.)	B	SR	32	7 (21.9%)	7	6	4	3	2				(6.25% age 6)	
4M 2F at least 5 1F at least 6 4M at least 7	C	SR	206	45 (21.3%)	45	23	11	7	5	1			(4 age 7)	
American Tree Sparrow	A D	WR WR	430 265	21 0	21	11	2	1						(age 4)
Chipping Sparrow	B D	SR SR	108 424	7 17	7 17	5 3	1	1					(age 4)	(age 3)
Field Sparrow	A B D	SR some WR or PR	102 27 408	23 (20%) 40	23 40	6 13	2 4			1			(age 3) (1 age 5)	
Harris' Sparrow	A	WR	ad550 IM1173	(8.9+ %) 154	154	71	42	24	13	7			(4 age 8) (3 age 7)	
TOTAL 1723														

Table 2 Continued.

SPECIES	LOCATION	STATUS	TOTAL BANDED	TOTAL RETURNED	— SURVIVAL FROM YEAR OF BANDING —								OLDEST AGES	FR or R's
					R <sup>1</sup>	R <sup>2</sup>	R <sup>3</sup>	R <sup>4</sup>	R <sup>5</sup>	R <sup>6</sup>	R <sup>7</sup>	R <sup>8</sup>		
Dark-eyed Junco	A	WR	218	8	8	4	3	2					(age 4½)	
	B	WR	1003	49	49	20	9	4					(1 age 6)	
TOTAL 1817 (133R)	D	WR	596	76	76	37	9	1					(1 age 4+)	
Red-winged Blackbird	A	PR	293	15	15	6	3	1					(1 age 5)	7
	B		3											
TOTAL 307	D		6											
Purple Finch	A	WR	15	0										
	B	WR	263	0										
	C	SR												
	D	WR	10	0										
		WR	2276	ASYM71	31	18	17	2	1	2			(age 7)	
				SYM37	15	10	11	1	1		1		(age 7)	
				F73	30	22	14	5						
TOTALS			2276	181	76	50	42	8	2M	2M	1SYM	(last 3	age 7)	
Survival Ratio				7.9%	181	105	55	13	5	3	1			
Pine Siskin	B	WR	71	0	1 FR									1 FR'
(TOTAL 1834)	D	WR	1763		5	1		1						
Survival Ratio					8	2		1					(age 4)	
American Goldfinch	B	WR	244											
		SR												
(TOTAL 4053)	D	SR	3809	M249	144	69	22	11	3					
		WR												
	Some	SR	F118	58	37	16	5	1	1			(1 F age 6)		
TOTALS	PR		3809	367	202	106	38	16	4	1		(1 F age 5)		
					367	165	59	21	5	1		(3 M age 5)		
					11.60%	7.16%	4.28%	2.49%	1.01%	.27%				
Evening Grosbeak	B	WR	233	0										13
	C	SR	7	0										
	D	WR	88	0										1
TOTAL			328											
			No returns, but widespread foreign recoveries								(Total 14)		(1 age 8)	

**Abbreviations and symbols**

Locations A B C D (see Table I)

Status WR = winter resident

SR = summer resident

PR = species present year round

FR = foreign recoveries of Baumgartner's birds encountered elsewhere

Survival rating R1 = bird recaptured approximately one year after banding

R2 = etc. ibid each succeeding year

Age banded AHY = Adult (ad.)

HY = Immature (im.)

(under a year)

But midwinter swarms of finches which presumably include no migrants consistently average near 20% returns.

And my first winter banding of Harris' Sparrows, including 51 birds, produced a record. The following winter 25 returned, a 50% return ratio.

These figures cannot be dismissed as happenstance, or too small a sample to be meaningful. The fact that they happened indicates their true potential.

**Longevity**

Relatively few small land birds survive beyond four years. Of my 22,237 bandings of the 48 species for which I have returns, there are 1928 that survived at least one year. (8.7%).

Of these, a paltry 95 survived beyond age 4. Numbers of birds that I recovered to advanced ages include:

48 to age 5  
20 to age 6 (1 Blue Jay, 2 Red-bellied Woodpeckers)  
18 to age 7  
5 to age 8 (Cardinal banded as HY Female, found dead)

3 to age 9

1 to age 12

**Conclusion**

A valid survival ratio involves more than a handful of the oldest birds. The records must cover a long enough period to permit several generations of birds to live their full potential. The species included in the computations must be primarily resident (WR - SR - PR) to the banding area. And the habitat must remain suitable for those long-lived birds who may eventually pass that way again.

If another 50 years of banding yields me additional wonders, I will send you all special delivery letters.

(Inland)